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ABSTRACT

This paper describes a qualitative study investigating the Capital Area Technology and Inquiry in Education (CATIE) model of situated professional development for technology integration in schools and classrooms. The CATIE model is called "situated" because it places educational technology experts in schools on an ongoing basis where they collaborate directly with teachers to develop and deliver technology enhanced lessons. Teacher learning about technology integration is thus situated in authentic technology integration activities. Unique about the CATIE model is that mentors work with schools and teachers on a long term, daily basis, that they work to incorporate technology use into existing curricula, and that they work in real classrooms directly with teachers and students. The CATIE program thus tends to reach most of the teachers and administrators in a school, and the results can be seen in terms of student learning, technology integration, and changes in school cultures. Findings from data collected to date, including monthly mentor reports, interviews with mentors, teachers, and school administrators, classroom observations, and student artifacts, are used to support discussion of the model. (Contains 10 references.) (Author)

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Situated Professional Development: The CATIE Model

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Abstract

This presentation will describe a qualitative study investigating the Capital Area Technology and Inquiry in Education (CATIE) model of situated professional development for technology integration in schools and classrooms. We call the CATIE model "situated" because it places educational technology experts in schools on an ongoing basis where they collaborate directly with teachers to develop and deliver technology enhanced lessons. Teacher learning about technology integration is thus situated in authentic technology integration activities. What we think is unique about the CATIE model is that mentors work with schools and teachers on a long term, daily basis, that they work to incorporate technology use into existing curricula, and that they work in real classrooms directly with teachers and students. The CATIE program thus tends to reach most of the teachers and administrators in a school, and we can see the results in terms of student learning, technology integration, and changes in school cultures. Findings from data collected to date, including monthly mentor reports, interviews with mentors, teachers, and school administrators, classroom observations, and student artifacts, will be used to support discussion of the model.

Background

Recent large scale studies of computer usage in schools (Panel on Educational Technology, 1997; Educational Testing Service, 1998; Becker, Ravitz & Wong, 1999) have precipitated public debate concerning the efficacy of using computers to support instruction, and have highlighted the need for professional development in this area. While emphasizing the need for professional development and pointing to the relationship between it and more sophisticated uses of technology in schools, these and other studies suggest that our understanding of what sorts of professional development programs impact technology integration at school and classroom levels needs to be improved. What we do know is that the teacher training, "expert model" of professional development (Sparks, 1994) does not work, especially when it comes to learning about educational technologies and their integration across the curriculum. Indeed, teacher lore suggests that traditional inservice teacher education has little impact on teaching practices in general. Smylie (1989), for example, found that teachers ranked inservice training last out of fourteen possible opportunities for learning. What teachers ranked as most important was direct classroom experience. Even exemplary professional development programs find it difficult to maintain support for teachers (Carey & Frechtling, 1997), to encourage sustained discourse among participating teachers (Schlager & Schank, 1997), to "scale up" (Corcoran, 1995) through the inclusions of all teachers, and to develop, test, and disseminate new teaching and learning ideas. Researchers agree that new models of professional development are needed, and that such models must include a focus on the development of local cultures of interest if they are to be sustainable.

Situated Professional Development

Putnam and Borko (2000) relate recent trends in research on professional development to new understandings of the nature of learning and knowing that collectively have been labeled "situative"

(Greeno, 1997). They identify three conceptual themes central to situative perspectives – that cognition is situated in particular physical and social contexts, that it is social in nature, and that knowing is distributed across the individual, others, and tools (p. 4) – which they believe have important implications for professional development. Putnam and Borko argue that how teachers learn new methods of teaching is no different from any learning. If knowledge and learning are indeed situative, then the most effective inservice education will be situated in authentic classroom practice.

To our knowledge, such perspective has not been used to frame either the development of, or research on, professional development programs aimed at technology integration, although a situative perspective is widespread in the research and development of technology-based educational programs. It only makes sense, and yet most professional development programs aimed at technology integration are instructionist, application-driven workshops or summer "institutes" well removed from classroom practice. Some have argued that while not optimal, such approaches are often the only practical solutions to meeting large-scale professional development needs with limited resources (Wilson & Berne, 1999). What little research there is suggests such activities have little impact on the day-to-day integration of computing technologies into classroom teaching and learning (Panel on Educational Technology, 1997; Educational Testing Service, 1998).

The CATIE Program

It is hard to see how approaches that consistently have had little or no effect on classroom-based technology integration can be deemed "practical," thus we decided to try an "impractical" approach. The Capital Area Technology and Inquiry in Education (CATIE) program was established through the Center for Initiatives in Pre-College Education (CIPCE) at Rennselaer Polytechnic Institute as an innovative means for addressing technology-based, constructivist-oriented staff development in elementary schools in the greater Troy (NY) region. This unique program places technology experts in elementary school buildings where they serve as mentors to teachers interested in integrating the use of technology into their day-to-day classroom activities. The school-based mentors provide training to teachers on technology utilization, but, more importantly, the mentors work with teachers to jointly design computer-supported lessons that incorporate technology into existing classroom curricula. Teacher learning about technology integration is thus situated in authentic technology integration activities.

Typically, the mentors first meet with teachers, both individually and in groups, to discuss how technology might be used to enhance learning in planned units on particular topics. Mentors try to avoid planning that is either artificial or focused on specific software applications. They then work with teachers to design computer-supported lessons that are integral parts of larger, classroom-based learning units. They encourage inquiry-based, student-centered, constructivist uses of computing technologies, but they do not insist on them. Often, mentors model best practices in computer-based teaching and learning by taking the

lead in implementing jointly created lessons. They then guide teachers in designing and implementing their own computer-based lessons, gradually fading their support as teachers become more confident in the use of electronic technologies.

Mentor support, however, does not just disappear. Each mentor structures his or her schedule according to their school and participating teachers' individual needs. Generally, the mentor is available two or three days each week for a period of two years or more to work with teachers and students on a continuing, as needed basis. Many teachers, having mastered a particular technology tool, return to their mentor for help in utilizing other applications in their teaching. Some teachers just come to share with their mentors the ways in which they are using technology on their own, and some mentors meet regularly with groups of teachers to discuss technology integration. As mentors become a part of the culture of the school, formal and informal conversations of this sort become more common and ongoing, and a discourse community grows up around technology integration.

Methodology

The research design was qualitative. Questions addressed included the impact of the CATIE program on teachers' integration of technology into regular classroom teaching and learning, CATIE's impact on the culture of technology integration in individual schools, and the affordances and constraints on that process across schools. We were also interested in how CATIE mentors viewed their work. Because the nature of technology integration clearly seems to be situated in individual schools (Swan, Jennings & Meier, 2001), we looked at each of the schools in which CATIE mentors worked as a single case within the larger investigation of the CATIE program.

In the 2000/2001 school year, there were ten CATIE mentors working in 14 elementary schools in four school districts in the greater Troy, NY area. The schools in which mentors were placed were all urban, but ranged in size from quite small (12 teachers) to quite large (101 teachers) and varied in ethnic and SES characteristics by neighborhoods. In 2000/2001, CATIE mentors worked with 188 teachers and over 4,000 students. They turned in monthly reports detailing the teachers and students they worked with, lessons jointly developed, and any outstanding successes or problems they encountered. Mentors also met biweekly with the researchers to discuss the same. The researchers visited all schools at least twice, where they observed mentors work with teachers and students and took field notes. They also conducted onsite interviews with mentors, school administrators, and teachers with whom the mentors were working, and collected samples of student work.

Data sources thus included the monthly mentor reports, notes from mentor meetings, transcripts of interviews with mentors, teachers, and school administrators, field notes, and student artifacts. Data analyses consisted of the constant comparison method to look for emergent themes.

Preliminary Findings

Clearly, the CATIE program exhibits the features Putnam and Borko (1997) identify as essential to effective teacher education:

- Teachers involved in the CATIE program are treated as active learners who construct their own learning to meet their own specific professional needs. CATIE mentors serve as facilitators for that learning but follow and respect the directions it takes.
- Thus, teachers in the CATIE program are empowered to use technology in their teaching (through the on-site support of the mentors) and treated as the professionals they are.
- In the CATIE program, teacher learning about technology integration is situated in classroom practice.
- CATIE mentors model constructivist, student-centered teaching with technology in their work with both students and teachers. Mentors thus treat teachers the way they would have them treat students.

Mentors spend the majority of their time working with teachers and students in the computer labs of their participating schools, although they also assisted some classes within their own classrooms. The latter is the goal of the program and is increasing but we are still not satisfied with the lack of classroom usage. This seems to have to do with the availability and quality of equipment in schools and classrooms, but the relationship is complex and interesting. In some cases, for example, classroom usage is hampered by the lack of computers with Internet access in classrooms. However, in several schools CATIE is involved with, there are multiple computers with Internet connections in classrooms that are not well utilized. In these schools, there is also a high quality computer room. In these schools, teachers seem more comfortable with the computer room because it affords each student a computer and so allows teachers to work in more traditional modes. Indeed, the one school in which more use is made of classroom computers the computer room computers are older and incapable of running more complex programs such as Hyperstudio.

A related goal in CATIE is to encourage teachers to look beyond their current uses of technology. This seems to be happening with the more technology-experienced participating teachers, and with teachers involved in their second or third years with the program. The CATIE program has also made significant gains in helping teachers less familiar with educational technology become comfortable in its use. An interesting finding involves what we are calling the "learning by lurking" phenomenon – teachers who have been only peripherally involved in CATIE become involved after the program has been in their school for several years. To date, CATIE mentors have assisted approximately 350 teachers in fourteen schools in four school districts to create and implement lessons that integrate the use of technology into regular classroom activities.

Flexibility and adaptability were found to be central to best practices in mentoring. Mentors' ability to work with variations in teacher learning styles, pedagogical approaches, and prior experiences, as well as with

existing school technology resources were found to significantly influence technology integration in schools and classrooms. An unexpected finding regarding mentors was their programmatic focus. The CATIE program's mission is focused on teachers. In interviewing mentors, however, we found that many mentors were at least as concerned with student learning as with teacher learning. The effect of such focus is being investigated.

Teacher perceptions of the CATIE program were overwhelmingly positive. Teachers uniformly reported increased knowledge of computing technologies, greater confidence in using them, and more creative teaching with computers. Positive outcomes for students, including greater independence, heightened self-efficacy, and increased motivation, were also noted by participating teachers. In most of the schools we visited, the CATIE program was seen as a valued part of the school culture, and many teachers noted changes in technology integration school-wide as a result.

Educational Significance

The CATIE program seems to be positively affecting technology integration in the schools in which it is operating. In this its fourth year of operation, its effects are becoming clearer. Most important of these, is the saturation of technology integration into the schools in which CATIE mentors are working. After several years of being present in schools, the CATIE program is reaching most of the teachers in those schools, which in turn seems to be changing their culture to include technology integration. Perhaps the best measure of its success is that one of the CATIE districts is adopting mentoring as the preferred means of technology training. Common sense indicates that the CATIE program is successful because it is reaching out to teachers in the physical and social context of their practice, because it provides ongoing, long-term support for technology integration, and because of the personal relationships mentors are forging with participating teachers within the culture of the schools in which they work. Its success thus supports a situative perspective on teacher learning, especially teacher learning about technology and technology integration.

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